# Progress on the Implementation of IC 16-38-4-7 (Birth Problems Registry)

**As amended in First Regular Session**

**112th General Assembly (2001)**

**Reporting Period: July 2006-June 2007**

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**Progress on the Implementation of IC 16-38-4-7 (Birth Problems Registry) as amended in First Regular Session 112th General Assembly (2001)**
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The Indiana Birth Defects and Problems Registry (IBDPR) is a population-based surveillance system designed to aid in the prevention of birth defects and childhood developmental disabilities and to enhance the quality of life of affected Indiana residents.

Birth defects are conditions present at birth that affect the structure or function of an infant's body. They can cause physical, mental, and medical problems. Some birth defects such as cleft lip or club foot are easy to observe, but others such as heart defects are found using special tests such as echocardiograms. About one out of 33 babies is born with a major birth defect in the United States. Birth defects are the leading cause of death in infants. The lifetime cost of caring for children born with birth defects each year is estimated to be about $8 billion (from a 1995 California study based on 1992 dollars). Some of these defects are entirely preventable, while others could be identified early and treated or managed in order to improve the quality of life of affected infants and their families. (See web site: www.in.gov/isdh/programs/ibdpr/index.htm.)

The 1986 Indiana General Assembly enacted a law (IC 16-4-10-6) to establish the Birth Problems Registry by January 1, 1987. In 2001, the Indiana Birth Problems Registry law (IC 16-38-4-7; 410 IAC 21-3) was amended to allow additional data sources to be used to improve the quality of the data. Data from the Indiana Birth Defects and Problems Registry will be used to detect trends in birth defects and suggest areas for further study; to identify epidemiological factors associated with birth defects; to address community concerns about the environmental effects on birth outcomes; to evaluate education, screening, and prevention programs; and to establish efficient referral systems that provide special services for the children with identified birth defects and their families.

The Indiana State Department of Health (ISHD) staff obtained a three-year CDC Cooperative Agreement, a four-year Health Resource Service Administration (HRSA) Genetics Implementation Grant, a HRSA State Systems Development Initiative (SSDI), and HRSA's Title V Block Grant to fund the development of the enhanced IBDPR both programmatically and technically.

To improve the follow up services of the Universal Hearing Screening Program of ISDH, the IBDPR rule was amended to include hearing loss as a reportable condition and to require audiologists to report hearing loss diagnoses to the ISDH. The rule amendment process was completed in September 2006 and the final rule was published in the Indiana Registry October 2006. Hospitals, physicians, psychologists and audiologists were informed about the expansion of the IBDPR rule by mail. Since in January 2007, all data providers are required to report hearing loss data.

## Case Ascertainment

The Indiana Birth Defects and Problems Registry (IBDPR) is considered a "passive" system because initial case ascertainment is through the electronic submission of hospital discharge data (HDD) with defined ICD-9-CM codes that identify birth defects and problems. However, in the early stages of program development, it was determined that up to 25 percent of the HDD were invalid. Therefore, the program protocol initially includes completing medical chart audits on the 44 CDC-targeted conditions reported to ISDH to ensure the data submitted to CDC is as valid as possible and to ensure information sent to families is appropriate. By the end of May 2007, IBDPR staff completed the chart audits and confirmations for 2003 and 2004 births. When confirmed data for three years are available, the need to continue chart auditing will be evaluated for each CDC-targeted condition.

Hospital Reporting:

All 111 reporting hospitals are now submitting their monthly discharge data using Indiana Health Data Center web portal. By the end of July 2007, 53 hospitals have reported through June 2007, 44 hospitals have reported through May 2007 and 13 hospitals through March 2007. One hospital has only reported through December 2006. (Staff is currently working with this hospital to ensure timely submissions.) Hospitals are required to report birth defects data to IBDPR when they complete coding hospital discharge records for each month. The changes in data collection and recording systems and lack of resources such as medical records or information technology staff have been presented as reasons for the delays or irregular data reporting.

Physician Reporting:

The IBDPR uses physician reporting to identify children with birth defects that may not be diagnosable at birth and may, therefore, be diagnosed in a doctor's office rather than a hospital. The IBDPR staff considers a physician's submission as confirmation of a diagnosis. No auditing is done on charts in a physician's office. If the IBDPR has received duplicate information from a hospital and no chart audit has been completed, the physician's report will be confirmation of that birth defect and no chart audit will be done at the hospital. IBDPR staff expects that reports of children with certain conditions (i.e. autism and fetal alcohol spectrum disorder) will be ascertained primarily from physician reporting.

In February 2007, IBDPR mailed information packets to statewide physicians and psychologists to acknowledge birth defects awareness month and to inform them about the IBDPR rule expansion. These packets included a letter from the Health Commissioner, new reportable conditions list, revised reporting form to increase the efficiency of reporting and reviewing, an IBDPR fact sheet and an informative flyer about birth defects reporting. The physician's report form is also available on the IBDPR website (www.in.gov/isdh/programs/ibdpr/birth_defects.pdf).

A total of 951 submissions have been reported by 48 physicians and four psychologists since the beginning of the physician reporting system in January 2004 through July 2007. No

significant increase in physician reporting was observed as a result of the February 2007 mailings. Five new practitioners have reported after March 15, 2007. Seven practitioners report regularly.

**Application Development**

The IBDPR data mart as well as the Operational Data Store (ODS) continue to be enhanced. In the spring of 2007, newborn screening data from the Universal Hearing Screening Program were integrated into the Operational Data Store (ODS). IBDPR is now working to incorporate audiologist reports in the hearing screening data mart. Integrated data from different data sources increase the accuracy of child health profiles and the efficiency of medical record audits.

In early 2007 the IBDPR began using the mother's county of residence at the time of birth for each birth defect case. Last year, data analysis was based on county of birth instead of mother's county of residence. IBDPR submitted annual data sets of 2003 and 2004 births (Tables 6 and 7) in June 2007, which will be published in Birth Defects Research Part A: Clinical and Molecular Teratology in December 2007. This is required by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement Grant from 2002-2005 to set up a birth defects data collection system separate from vital record information,.

IBDPR is now developing an electronic application which will allow staff members to identify children with certain confirmed birth defects and send educational and resource information packets to their parents or guardians. This application will be ready in the fall of 2007.

**Program Development**

The goals of the program are to improve the quality of the data available on birth defects in Indiana and to provide information to physicians and families related to understanding the birth defect of their child and resources available to them. The ISDH has promulgated rules regarding the case ascertainment (who and what needs to be reported to ISDH) with each legislative change.

In September 2006, IBDPR rule was amended (IAC 21-3-7 and IAC 21-3-9) to include hearing loss as a reportable condition and to mandate statewide audiologists to report hearing loss diagnoses to the ISDH. The final rule was published in Indiana Registry – October 2006. Also a more efficient and user friendly physician reporting form was made available with the rule amendment. Hospitals, physicians, psychologists and audiologists were informed about the expansion of the IBDPR rule by mail. All data providers are required to report hearing loss data since in January 2007. Updated rule changes can be found on the IBDPR website.

When the electronic application to identify children with certain confirmed birth defects is available, IBDPR will send educational and resource information packets to the parents or

guardians of the children who are born in 2004 and later. The effectiveness of these mailings will be evaluated once the program is fully functioning.

**National Meetings Attended**

In November 2006, IBDPR and ODS hosted a Connections site visit meeting in Indianapolis funded by the Public Health Informatics Institute. This conference provided strategies, best practices, and lessons learned from Indiana's integrated child health information system and ODS. Connections is a program of the Public Health Informatics Institute and is supported by the Genetic Services Branch of the Health Resources and Services Administration's Maternal and Child Health Bureau (HRSA/MCHB).

In January 2007, four staff members attended the 10th annual meeting of National Birth Defects Prevention Network (NBDPN), on "Advances and Opportunities for Birth Defects Surveillance, Research and Prevention" in San Antonio, Texas. Attendance to the conference was recommended by the Centers for Disease Control and Prevention (CDC) and was funded by HRSA Genetics Implementation Grant. It was designed to develop relationships among federal, state and professional organizations that are working towards common goals. At this conference IBDPR presented a poster titled "Development of an Electronic Data Collection and Integration System to Improve the Completeness and Accuracy of Birth Defects" which described its data sources, person-centric database (ODS) and data marts to utilize data for research and education purposes. The conference also provided an opportunity to have discussions about successful approaches to reduce and prevent birth defects.

**Statute Requisites**

The development of reports has become more detailed as more data have been collected. More information is added daily on children from birth to three or five years of age. Therefore, the same report compiled on different dates for the same time period may have different values. The data for the following reports were compiled on 10/22/2007. Because the numbers of birth defects are so small, the data will be grouped in multiple years, as is done for the national publication. The report reflects the first two years of data available. The reports will continue to become more refined as the program matures.

1) The numbers and types of birth problems occurring in Indiana by county:

The data presented in Tables 1- 3 were obtained from the data files submitted to IBDPR by statewide hospitals as required by the Birth Problems Registry law (IC 16-38-4-7; 410 IAC 21-3) and through physician reporting. The hospitals extract these data from their hospital discharge (UB-92) records.

IBDPR started collecting birth defects data separate from vital records data in the fall of 2002. Therefore, for this report we have analyzed these data for the children born in 2003 and 2004 according to the conditions or categories listed in IBDPR's Reportable Conditions List (Table 1). According to Vital Records data in ODS there are 174,208 live births for 2003 and 2004.

To verify the accuracy of hospital discharge data, IBDPR targeted 44 specific birth defects of the reported conditions to be audited by ISDH staff/contractors. These 44 defects are recommended by the National Birth Defects Prevention Network and are published for most of the states nationwide in Birth Defects Research Part A: Clinical and Molecular Teratology, annually. ISDH chart auditors visit the hospitals and review the medical records of children who have been reported to IBDPR with one or more targeted conditions to assess them as confirmed or probable (Table 5).

About 56 percent of the children reported as having birth defects through hospital discharge data were determined to have confirmed or highly probable (chart audit does not provide the conclusive confirmation evidence, but the genetic specialist concludes that it is highly probable that it is a diagnosis) conditions based on medical chart audits for 2003-2004 births. Of the targeted birth defects reported and confirmed, about 82.5 percent are to non-Hispanic white children, 8.9 percent to non-Hispanic black children, 6 percent to Hispanic children, <1 percent to Asian children and American Indian, and 1.7 percent to children of other races/ethnicities. The data reflects that 2.9% of the births in Indiana were confirmed with a targeted condition. The national estimate for birth defects is 3-5%.

The following explains the attached tables:

Table 1 shows the number of children reported by the hospitals through discharge ICD-9-CM codes for each reportable condition category. These are children who are counted only once for each condition category reported. However, many children with birth defects or problems have more than one defect, so one child may be reflected in more than one condition category. These numbers do not reflect confirmation of the defect, merely hospital reporting. It is important to note that in the Autism and Fetal Alcohol Syndrome (FAS) categories, the number of cases reported by the hospital has decreased in the more recent birth years. This supports the need for the IBDPR to follow children from birth to 3 years of age (or 5 years of age for Autism and FAS) to identify birth conditions that may not manifest themselves for several years beyond birth. The data also reinforce the importance of physician reporting of birth defects or conditions found as the child ages.

Note also that the reporting of “congenital anomalies of integument” (or skin) has increase considerably since reporting started in 2003. This is not a targeted condition, so no confirmations of these conditions have been attempted. However, it might be something the program staff would want to study in the future.

Table 2 shows the number of children reported with only one reportable condition and Table 3 shows the number of children reported with more than one reportable condition. The count is unduplicated by condition category. These tables are subsets of Table 1 and, again, do not reflect whether there is a confirmed diagnosis that supports the discharge code. More children are reported with more than one condition or anomaly than just one.

Tables 4A and 4B reflect the sources of case ascertainment for the targeted conditions and non-targeted reportable conditions. It is important to note that of the targeted conditions, the following have a high percentage of cases that are reported by physician only:

anotia/microtia, 30 percent; autism, 13 percent; diaphragmatic hernia, 5 percent; fetus or newborn affected by maternal alcohol use (FASD), 35 percent; microcephalus, 5 percent; and reduction deformity, upper limbs 13 percent. Of the reportable conditions not included in the target group, 28 percent of the Autism spectrum disorders and 6 percent of chromosomal anomalies are reported by physicians only. Physician reporting is key to having reliable rates for many conditions mentioned.

Table 5 reflects the targeted conditions by categories reported to the IBDPR from hospital discharge date for children born in 2003-2004 and where the medical chart audit found the condition to be confirmed or probable by chart audit.The percentage of confirmed targeted conditions reflects the validity of the hospital discharge reporting.

In Table 5, with a second year of data being incorporated, physician reports available to confirm diagnoses, and a refinement in the reports, the overall percentage of confirmed has dropped from 77 percent to 56 percent. Chromosomal anomalies (85 percent valid) and gastrointestinal anomalies (81.2 percent valid) have the greatest accuracy. Reports through hospital discharge data of "Fetal Alcohol Syndrome" were able to be substantiated by chart audit and physician reports in 69.4 percent (versus 37.5 percent in year one data) of the children. This improvement is probably related to having a second year to diagnose babies born in 2003 plus a second year of births. Additional refinement of the data in Table 5 is needed. Once we have three years of data to review, staff will be able to identify the specific conditions that are accurately reported through hospital discharge.

Table 6 provides the counts and rates per 10,000 births by race of confirmed and probable targeted birth defect conditions for Indiana children born in 2003-2004 who have been reported to IBDPR. (A "probable" condition is one that has been audited where the criteria for confirmation was not complete but was adequate enough to determine the condition to be likely. A "probable" condition is counted as confirmed for counts and rates.) Overall rate of 284 per 10,000 births is very close to national estimates.

Table 7 indicates Trisomy (the presence of three, rather than the normal two, copies of a chromosome, e.g., children born with a third copy of chromosome 21 have Down Syndrome) counts and rates of infants born in 2003-2004 by maternal age.

Table 8 shows the counts and rates per 1,000 births of confirmed and probable targeted birth defect conditions for Indiana children born in 2003-2004 for each county of Indiana. If the count is less than five for a specific targeted condition, the condition is not listed but the count is included in the total defect count for that county. If the total number of defects in a county is less than five, are suppressed in order to maintain confidentiality.

2) <u>The amount of use of the birth problems registry by researchers:</u>
Annual Indiana data of the 2003 births (Table 6) were submitted to National Birth Defects Prevention Network (NBDPN) in June 2007 which will be published in Birth Defects Research Part A: Clinical and Molecular Teratology in December 2007. IBDPR did not receive any other data requests from researches within this fiscal year. However, an epidemiology masters degree intern will be using the data early in the next fiscal year to

study gastroschisis in Indiana. IBDPR data will be most useful for research and analysis when several years of data are available.

3) Proposals for the prevention of birth problems occurring in Indiana:
The Folic Acid Campaign marketing activities continued with funding from Title V through May 2006. The purpose of the Campaign is to increase awareness and stimulate behavior change with the target audience (women of child bearing age) through educating and marketing a new theme, "Take It, Seriously." Distribution of materials will continue. Activities for FY 2006 include:

- Distributed Folic Acid Friendly Office Kits (1st quarter 2005) to all WIC Clinics (approximately 160) statewide.
- Provided displays and educational presentations to bridal trade shows and educational conferences.
- Designed middle and high school educational curriculum, now available on the website.
- The "Take It, Seriously" message was marketed in college newspapers, at local sports events, on the radio, and on bookmarks distributed to libraries.
- A follow-up consumer phone survey was completed to determine any increase in folic acid awareness and/or a change in behavior that has occurred in the last year. Of those surveyed in 2006, everyone knew something about folic acid (a 25 percent improvement). All knowledge levels increased, but there was only a 1 percent increase in those who said they knew a lot about folic acid. However, when asked about when folic acid should be taken, 55 percent (up from 10 percent) indicated that it should be take before pregnancy. This is a good outcome.
- A Folic Acid/In Shape Indiana bookmark was developed and printed for use in clinics and health fairs.
- Website is being maintained and up-dated: (www.in.gov/isdh/programs/FolicAcid)

The Fetal Alcohol Spectrum Disorder (FASD) Task Force met regularly throughout the year to facilitate the development of the needs assessment and strategic plan. The goal of this effort is that "No baby shall be born in Indiana with Fetal Alcohol Spectrum Disorder." The following activities were completed in the last year:

- The needs assessment and strategic plan for addressing Fetal Alcohol Spectrum Disorders (FASD) was completed in June 2006. The strategic plan will be finalized and put on the Web site in the near future.
- The goals of a prevention campaign were determined to be:
    1. To increase awareness of the consequences of alcohol consumption by pregnant women through a direct marketing campaign throughout the state.
    2. To educate Indiana communities about FASD and how to prevent it.
    3. To support the efforts of up to four local communities to plan and implement the FASD Prevention Campaign.
    4. To replicate FASD Prevention Campaigns in additional communities.
    5. To evaluate the FASD Prevention Campaign throughout the state.
- As part of the needs assessment and strategic plan development, surveys were developed, distributed and compiled for women and health professionals, and community dialogues were held to gain insights about the plan.
- Funding opportunities to implement the plan are being evaluated.

# APPENDICES

Table 1: Number of Children* Reported** to IBDPR by Birth Year

| Condition Name/Category | ICD-9-CM Codes | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Adenoma of lung bronchus | 212.30 | | 1 | 1 | 1 |
| Anomalies of jaw | 524.00-524.10 | 50 | 54 | 53 | 55 |
| Anterior horn cell disease | 335.00-335.99 | 4 | 8 | 1 | 2 |
| Autism, Childhood disintegrative disorder, Asperger, Rett syndrome, and Pervasive developmental disorders not otherwise specified | 299.00-299.99 | 158 | 79 | 18 | 5 |
| Cardiovascular anomalies | 745.00-747.99 | 1,715 | 1,920 | 1,939 | 1,872 |
| Central nervous system anomalies | 740.00-742.99 | 344 | 311 | 321 | 292 |
| Cerebral degenerations usually manifest in childhood | 330.00-330.99 | 9 | 5 | 4 | |
| Chromosomal anomalies | 758.00-758.99 | 184 | 188 | 177 | 173 |
| Cleft palate and cleft lip | 749.00-749.99 | 140 | 167 | 140 | 138 |
| Coagulation defects | 286.00-286.50 | 32 | 21 | 12 | 17 |
| Congenital anomalies of integument | 757.00-757.99 | 346 | 689 | 1,062 | 1,495 |
| Congenital nystagmus | 379.51 | 6 | 3 | 9 | 5 |
| Constitutional aplastic anemia | 284.00 | 1 | 1 | 1 | |
| Diabetes mellitus | 250.00-250.99 | 164 | 128 | 65 | 40 |
| Diseases of white blood cells | 288.00-288.99 | 615 | 665 | 534 | 375 |
| Disorders involving the immune mechanism | 279.00-279.99 | 54 | 48 | 42 | 21 |
| Dyshormonogenic goiter | 246.10 | 2 | | | |
| Ear, Face and Neck anomalies | 744.00-744.99 | 192 | 189 | 178 | 170 |
| Eye anomalies | 743.00-743.99 | 237 | 203 | 177 | 158 |
| Fetal alcohol syndrome | 760.71 | 26 | 29 | 17 | 14 |
| Gastrointestinal anomalies | 750.30-751.99 | 344 | 447 | 437 | 467 |
| Genitourinary anomalies | 752.00-753.99 | 1,221 | 1,375 | 1,266 | 1,155 |
| Hereditary hemolytic anemias | 282.00-282.99 | 117 | 155 | 128 | 118 |
| Hereditary retinal dystrophies | 362.70 | | | 1 | |
| Mesothelioma of peritoneum | 211.80 | | 1 | | |
| Muscular dystrophies and myopathies | 359.00-359.99 | 16 | 20 | 15 | 10 |
| Musculoskeletal anomalies | 754.00-756.99 | 1,515 | 1,697 | 1,604 | 1,502 |
| Neoplasms of lip | 140.00-208.99 | 96 | 88 | 53 | 35 |
| Neoplasms of skin | 216.00-216.99 | 126 | 110 | 103 | 90 |
| Neoplasms-other | 230.00-239.99 | 64 | 43 | 60 | 60 |
| Other congenital anomalies | 759.00-759.99 | 203 | 189 | 190 | 161 |
| Other testicular dysfunction | 257.80 | | 1 | | |
| Primary thrombocytopenia | 287.30 | 33 | 30 | 7 | 1 |
| Respiratory system anomalies | 748.00-748.99 | 292 | 339 | 325 | 345 |
| Retrolental fibroplasia | 362.21 | 155 | 149 | 145 | 167 |
| Strabismus and other disorders of binocular eye movement | 378.00-378.99 | 106 | 85 | 55 | 33 |
| Upper alimentary tract anomalies | 750.00-750.29 | 357 | 361 | 321 | 335 |
| Waldenstroms macroglobulinemia | 273.30 | | 1 | 1 | 1 |

*whose mothers were Indiana residents at the time of child's birth

**Includes hospital discharge data and physician reports

Data compiled on 10/22/2007.

Table 2: Number of Children* Reported ** to IBDPR with Only One Reportable Condition by Birth Year

| Condition Name/Category | ICD-9-CM Codes | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Anomalies of jaw | 524.00-524.10 | 6 | 11 | 6 | 10 |
| Anterior horn cell disease | 335.00-335.99 | 1 | 2 | 1 | |
| Autism, Childhood disintegrative disorder, Asperger, Rett syndrome, and Pervasive developmental disorders not otherwise specified | 299.00-299.99 | 99 | 47 | 10 | 3 |
| Cardiovascular anomalies | 745.00-747.99 | 682 | 789 | 853 | 825 |
| Central nervous system anomalies | 740.00-742.99 | 111 | 125 | 133 | 122 |
| Cerebral degenerations usually manifest in childhood | 330.00-330.99 | 2 | 1 | 3 | |
| Chromosomal anomalies | 758.00-758.99 | 35 | 30 | 47 | 35 |
| Cleft palate and cleft lip | 749.00-749.99 | 49 | 49 | 41 | 56 |
| Coagulation defects | 286.00-286.50 | 18 | 12 | 3 | 9 |
| Congenital anomalies of integument | 757.00-757.99 | 272 | 572 | 925 | 1,265 |
| Congenital nystagmus | 379.51 | 3 | 1 | 5 | 2 |
| Diabetes mellitus | 250.00-250.99 | 115 | 83 | 51 | 29 |
| Diseases of white blood cells | 288.00-288.99 | 479 | 478 | 392 | 267 |
| Disorders involving the immune mechanism | 279.00-279.99 | 18 | 13 | 18 | 5 |
| Dyshormonogenic goiter | 246.10 | 2 | | | |
| Ear, Face and Neck anomalies | 744.00-744.99 | 112 | 105 | 97 | 85 |
| Eye anomalies | 743.00-743.99 | 172 | 152 | 118 | 103 |
| Fetal alcohol syndrome | 760.71 | 10 | 11 | 3 | 5 |
| Gastrointestinal anomalies | 750.30-751.99 | 233 | 301 | 272 | 317 |
| Genitourinary anomalies | 752.00-753.99 | 844 | 913 | 841 | 778 |
| Hereditary hemolytic anemias | 282.00-282.99 | 85 | 99 | 93 | 86 |
| Mesothelioma of peritoneum | 211.80 | | 1 | | |
| Muscular dystrophies and myopathies | 359.00-359.99 | 7 | 7 | 3 | 3 |
| Musculoskeletal anomalies | 754.00-756.99 | 1,021 | 1,119 | 1,062 | 1,013 |
| Neoplasms of lip | 140.00-208.99 | 32 | 29 | 20 | 16 |
| Neoplasms of skin | 216.00-216.99 | 96 | 85 | 79 | 62 |
| Neoplasms-other | 230.00-239.99 | 29 | 23 | 26 | 29 |
| Other congenital anomalies | 759.00-759.99 | 58 | 38 | 45 | 46 |
| Other testicular dysfunction | 257.80 | | 1 | | |
| Primary thrombocytopenia | 287.30 | 14 | 11 | 3 | |
| Respiratory system anomalies | 748.00-748.99 | 122 | 140 | 122 | 160 |
| Retrolental fibroplasia | 362.21 | 45 | 56 | 47 | 66 |
| Strabismus and other disorders of binocular eye movement | 378.00-378.99 | 54 | 41 | 23 | 17 |
| Upper alimentary tract anomalies | 750.00-750.29 | 284 | 287 | 257 | 277 |
| Waldenstroms macroglobulinemia | 273.30 | | 1 | 1 | 1 |

*whose mothers were Indiana residents at the time of child's birth
**includes hospital discharge data and physician reports
Data compiled on 10/22/2007.

Table 3: Number of Children* Reported** to IBDPR with More Than One Reportable Condition by Birth Year

| Condition Name/Category | ICD-9-CM Codes | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Adenoma of lung bronchus | 212.30 | | 1 | 1 | 1 |
| Anomalies of jaw | 524.00-524.10 | 44 | 43 | 47 | 45 |
| Anterior horn cell disease | 335.00-335.99 | 3 | 6 | | 2 |
| Autism, Childhood disintegrative disorder, Asperger, Rett syndrome, and Pervasive developmental disorders not otherwise specified | 299.00-299.99 | 59 | 32 | 8 | 2 |
| Cardiovascular anomalies | 745.00-747.99 | 1,033 | 1,131 | 1,086 | 1,047 |
| Central nervous system anomalies | 740.00-742.99 | 233 | 186 | 188 | 170 |
| Cerebral degenerations usually manifest in childhood | 330.00-330.99 | 7 | 4 | 1 | |
| Chromosomal anomalies | 758.00-758.99 | 149 | 158 | 130 | 138 |
| Cleft palate and cleft lip | 749.00-749.99 | 91 | 118 | 99 | 82 |
| Coagulation defects | 286.00-286.50 | 14 | 9 | 9 | 8 |
| Congenital anomalies of integument | 757.00-757.99 | 74 | 117 | 137 | 230 |
| Congenital nystagmus | 379.51 | 3 | 2 | 4 | 3 |
| Constitutional aplastic anemia | 284.00 | 1 | 1 | 1 | |
| Diabetes mellitus | 250.00-250.99 | 49 | 45 | 14 | 11 |
| Diseases of white blood cells | 288.00-288.99 | 136 | 187 | 142 | 108 |
| Disorders involving the immune mechanism | 279.00-279.99 | 36 | 35 | 24 | 16 |
| Ear, Face and Neck anomalies | 744.00-744.99 | 80 | 84 | 81 | 85 |
| Eye anomalies | 743.00-743.99 | 65 | 51 | 59 | 55 |
| Fetal alcohol syndrome | 760.71 | 16 | 18 | 14 | 9 |
| Gastrointestinal anomalies | 750.30-751.99 | 111 | 146 | 165 | 150 |
| Genitourinary anomalies | 752.00-753.99 | 377 | 462 | 425 | 377 |
| Hereditary hemolytic anemias | 282.00-282.99 | 32 | 56 | 35 | 32 |
| Hereditary retinal dystrophies | 362.70 | | | 1 | |
| Muscular dystrophies and myopathies | 359.00-359.99 | 9 | 13 | 12 | 7 |
| Musculoskeletal anomalies | 754.00-756.99 | 494 | 578 | 542 | 489 |
| Neoplasms of lip | 140.00-208.99 | 64 | 59 | 33 | 19 |
| Neoplasms of skin | 216.00-216.99 | 30 | 25 | 24 | 28 |
| Neoplasms-other | 230.00-239.99 | 35 | 20 | 34 | 31 |
| Other congenital anomalies | 759.00-759.99 | 145 | 151 | 145 | 115 |
| Primary thrombocytopenia | 287.30 | 19 | 19 | 4 | 1 |
| Respiratory system anomalies | 748.00-748.99 | 170 | 199 | 203 | 185 |
| Retrolental fibroplasia | 362.21 | 110 | 93 | 98 | 101 |
| Strabismus and other disorders of binocular eye movement | 378.00-378.99 | 52 | 44 | 32 | 16 |
| Upper alimentary tract anomalies | 750.00-750.29 | 73 | 74 | 64 | 58 |

*whose mothers were Indiana residents at the time of child's birth

**includes hospital discharge data and physician reports

Data compiled on 10/22/2007.

Table 4A: Sources of Case Ascertainment Data for Targeted Conditions of 2003-2004 Births to Indiana Women

| Defect | Total | Reported by Physician | Reported by Physician Only | Reported by Physician and Hospital | Reported by Hospital Only |
|---|---|---|---|---|---|
| Anencephalus | 12 | 0 | 0 | 0 | 12 |
| Aniridia | 2 | 0 | 0 | 0 | 2 |
| Anophthalmia/microphthalmia | 30 | 1 | 1 | 0 | 29 |
| Anotia/microtia | 10 | 3 | 3 | 0 | 7 |
| Aortic valve stenosis | 57 | 0 | 0 | 0 | 57 |
| Atrial septal defect | 1,759 | 4 | 3 | 1 | 1,755 |
| Autism | 173 | 35 | 23 | 12 | 138 |
| Biliary atresia | 15 | 0 | 0 | 0 | 15 |
| Bladder exstrophy | 3 | 0 | 0 | 0 | 3 |
| Choanal atresia | 34 | 0 | 0 | 0 | 34 |
| Cleft lip with and without cleft palate | 296 | 8 | 4 | 4 | 288 |
| Cleft palate without cleft lip | 189 | 10 | 3 | 7 | 179 |
| Coarctation of aorta | 151 | 5 | 3 | 2 | 146 |
| Common truncus | 13 | 0 | 0 | 0 | 13 |
| Congenital cataract | 29 | 1 | 0 | 1 | 28 |
| Congenital hip dislocation | 231 | 0 | 0 | 0 | 231 |
| Diaphragmatic hernia | 53 | 3 | 3 | 0 | 50 |
| Down syndrome | 219 | 24 | 5 | 19 | 195 |
| Ebstein's anomaly | 13 | 0 | 0 | 0 | 13 |
| Encephalocele | 18 | 0 | 0 | 0 | 18 |
| Endocardial cushion defect | 116 | 2 | 1 | 1 | 114 |
| Esophageal atresia/tracheoesophageal fistula | 38 | 0 | 0 | 0 | 38 |
| Fetus or newborn affected by maternal alcohol use | 55 | 28 | 19 | 9 | 27 |
| Gastroschisis | 62 | 0 | 0 | 0 | 62 |
| Hirshsprung's disease (congenital megacolon) | 47 | 1 | 0 | 1 | 46 |
| Hydrocephalus without spina bifida | 128 | 1 | 0 | 1 | 127 |
| Hypoplastic left heart syndrome | 44 | 0 | 0 | 0 | 44 |
| Hypospadias and Epispadias | 683 | 5 | 4 | 1 | 678 |
| Microcephalus | 250 | 17 | 13 | 4 | 233 |
| Obstructive genitourinary defect | 571 | 0 | 0 | 0 | 571 |
| Omphalocele | 8 | 0 | 0 | 0 | 8 |
| Patent ductus arteriosus | 1,346 | 2 | 1 | 1 | 1,344 |
| Pulmonary valve atresia and stenosis | 253 | 1 | 0 | 1 | 252 |
| Pyloric stenosis | 462 | 0 | 0 | 0 | 462 |
| Rectal and large intestinal atresia/stenosis | 59 | 0 | 0 | 0 | 59 |
| Reduction deformity, lower limbs | 29 | 2 | 1 | 1 | 27 |
| Reduction deformity, upper limbs | 53 | 9 | 7 | 2 | 44 |
| Renal agenesis/hypoplasia | 55 | 0 | 0 | 0 | 55 |
| Spina bifida without anencephalus | 151 | 2 | 1 | 1 | 149 |
| Tetralogy of fallot | 80 | 0 | 0 | 0 | 80 |
| Transposition of great arteries | 126 | 1 | 0 | 1 | 125 |
| Tricuspid valve atresia and stenosis | 21 | 0 | 0 | 0 | 21 |
| Trisomy 13 | 19 | 3 | 1 | 2 | 16 |
| Trisomy 18 | 22 | 3 | 0 | 3 | 19 |
| Ventricular septal defect | 891 | 8 | 6 | 2 | 883 |

Data compiled on 10/22/2007.

Table 4B: Sources of Case Ascertainment Data for Reportable Conditions* of 2003-2004 Births to Indiana Women

| Condition Name/Category | Total | Reported by Physician | Reported by Physician Only | Reported by Physician and Hospital | Reported by Hospital Only |
|---|---|---|---|---|---|
| Adenoma of lung bronchus | 1 | 0 | 0 | 0 | 1 |
| Anomalies of jaw | 118 | 2 | 2 | 0 | 116 |
| Anterior horn cell disease | 13 | 0 | 0 | 0 | 13 |
| Autism, Childhood disintegrative disorder, Asperger, Rett syndrome, and Pervasive developmental disorders not otherwise specified | 87 | 29 | 25 | 4 | 58 |
| Cardiovascular anomalies | 1959 | 12 | 9 | 3 | 1,947 |
| Central nervous system anomalies | 280 | 2 | 1 | 1 | 278 |
| Cerebral degenerations usually manifest in childhood | 14 | 1 | 1 | 0 | 13 |
| Chromosomal anomalies | 173 | 16 | 11 | 5 | 157 |
| Cleft palate and cleft lip | 4 | 0 | 0 | 0 | 4 |
| Coagulation defects | 72 | 0 | 0 | 0 | 72 |
| Congenital anomalies of integument | 1067 | 4 | 2 | 2 | 1,063 |
| Congenital nystagmus | 9 | 0 | 0 | 0 | 9 |
| Constitutional aplastic anemia | 2 | 0 | 0 | 0 | 2 |
| Diabetes mellitus | 361 | 1 | 1 | 0 | 360 |
| Diseases of white blood cells | 1337 | 0 | 0 | 0 | 1,337 |
| Disorders involving the immune mechanism | 128 | 1 | 0 | 1 | 127 |
| Dyshormonogenic goiter | 2 | 0 | 0 | 0 | 2 |
| Ear, Face and Neck anomalies | 403 | 4 | 3 | 1 | 399 |
| Eye anomalies | 406 | 1 | 1 | 0 | 405 |
| Gastrointestinal anomalies | 229 | 0 | 0 | 0 | 229 |
| Genitourinary anomalies | 1819 | 4 | 2 | 2 | 1,815 |
| Hereditary hemolytic anemias | 325 | 0 | 0 | 0 | 325 |
| Mesothelioma of peritoneum | 1 | 0 | 0 | 0 | 1 |
| Muscular dystrophies and myopathies | 44 | 1 | 1 | 0 | 43 |
| Musculoskeletal anomalies | 3425 | 71 | 51 | 20 | 3,354 |
| Neoplasms | 721 | 4 | 3 | 1 | 717 |
| Other congenital anomalies | 421 | 26 | 20 | 6 | 395 |
| Other Testicular dysfunction | 1 | 0 | 0 | 0 | 1 |
| Primary thrombocytopenia | 64 | 0 | 0 | 0 | 64 |
| Respiratory system anomalies | 633 | 8 | 7 | 1 | 625 |
| Retrolental fibroplasia | 304 | 0 | 0 | 0 | 304 |
| Strabismus and other disorders of binocular eye movement | 214 | 3 | 3 | 0 | 211 |
| Upper alimentary tract anomalies | 722 | 6 | 6 | 0 | 716 |
| Waldenstroms macroglobulinemia | 1 | 0 | 0 | 0 | 1 |

*excludes targeted conditions
Data compiled on 10/22/2007.

Table 5: Targeted Conditions Reported to IBDPR via Hospital Discharge Data for Children Born in 2003-2004 which are Confirmed or Determined as Probable by Medical Chart Audits or Physician Reports

| Category | ICD-9-CM Codes | Number of Children | Targeted Conditions Reported | Conditions per Child | Targeted Conditions Confirmed | Confirmed/ Probable Percentage |
|---|---|---|---|---|---|---|
| Autism, childhood disintegrative disorder, Asperger, Rett syndrome, and pervasive developmental disorders not otherwise specified | 299.00-299.99 | 149 | 150 | 1.01 | 14 | 9.3% |
| Cardiovascular anomalies | 745.00-747.99 | 3057 | 4856 | 1.59 | 2294 | 47.2% |
| Central nervous system anomalies | 740.00-742.99 | 467 | 545 | 1.17 | 321 | 58.9% |
| Chromosomal anomalies | 758.00-758.99 | 249 | 254 | 1.02 | 216 | 85.0% |
| Cleft palate and cleft lip | 749.00-749.99 | 306 | 478 | 1.56 | 306 | 64.0% |
| Ear, Face and Neck anomalies | 744.00-744.99 | 7 | 7 | 1.00 | 5 | 71.4% |
| Eye anomalies | 743.00-743.99 | 56 | 60 | 1.07 | 34 | 56.7% |
| Fetal alcohol syndrome | 760.71 | 36 | 36 | 1.00 | 25 | 69.4% |
| Gastrointestinal anomalies | 750.30-751.99 | 606 | 621 | 1.02 | 504 | 81.2% |
| Genitourinary anomalies | 752.00-753.99 | 1206 | 1308 | 1.08 | 914 | 69.9% |
| Musculoskeletal anomalies | 754.00-756.99 | 390 | 425 | 1.09 | 256 | 60.2% |
| Respiratory system anomalies | 748.00-748.99 | 34 | 34 | 1.00 | 21 | 61.8% |

Data compiled on 10/22/2007.

Table 6: Confirmed and Probable Counts and Rates by Race of the Targeted Conditions for 2003-2004 Births to Indiana Women (Rates per 10,000 live births displayed in shaded area.)

| | Race/Ethnicity | | | | | | |
|---|---|---|---|---|---|---|---|
| Defect | Non-Hispanic White | Non-Hispanic Black | Hispanic | Asian or Pacific Islander | American Indian or Alaskan Native | Other / Unknown | Total |
| Anencephalus | 5 | 1 | 2 | 0 | 0 | 0 | 8 |
| | 0.36 | 0.53 | 1.46 | 0 | 0 | | 0.46 |
| Aniridia | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 0 | 0.53 | 0 | 0 | 0 | | 0.06 |
| Anophthalmia/microphthalmia | 8 | 1 | 1 | 0 | 0 | 2 | 12 |
| | 0.58 | 0.53 | 0.73 | 0 | 0 | | 0.69 |
| Anotia/microtia | 4 | 0 | 3 | 0 | 0 | 1 | 8 |
| | 0.29 | 0 | 2.19 | 0 | 0 | | 0.46 |
| Aortic valve stenosis | 34 | 1 | 1 | 0 | 0 | 0 | 36 |
| | 2.47 | 0.53 | 0.73 | 0 | 0 | | 2.07 |
| Atrial septal defect | 553 | 71 | 37 | 1 | 1 | 6 | 669 |
| | 40.24 | 37.91 | 27.06 | 13.40 | 46.95 | | 38.40 |
| Autism | 31 | 2 | 1 | 0 | 0 | 3 | 37 |
| | 2.26 | 1.07 | 0.73 | 0 | 0 | | 2.12 |
| Biliary atresia | 9 | 1 | 2 | 0 | 0 | 1 | 13 |
| | 0.65 | 0.53 | 1.46 | 0 | 0 | | 0.75 |
| Bladder exstrophy | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| | 0 | 0 | 0 | 13.40 | 0 | | 0.11 |
| Choanal atresia | 17 | 2 | 2 | 0 | 0 | 0 | 21 |
| | 1.24 | 1.07 | 1.46 | 0 | 0 | | 1.21 |
| Cleft lip with and without cleft palate | 169 | 7 | 16 | 0 | 0 | 5 | 197 |
| | 12.30 | 3.74 | 11.70 | 0 | 0 | | 11.31 |
| Cleft palate without cleft lip | 97 | 8 | 6 | 0 | 0 | 2 | 113 |
| | 7.06 | 4.27 | 4.39 | 0 | 0 | | 6.49 |
| Coarctation of aorta | 89 | 9 | 8 | 1 | 0 | 2 | 109 |
| | 6.48 | 4.81 | 5.85 | 13.40 | 0 | | 6.26 |
| Common truncus | 8 | 2 | 0 | 0 | 0 | 0 | 10 |
| | 0.58 | 1.07 | 0 | 0 | 0 | | 0.57 |
| Congenital cataract | 16 | 3 | 3 | 0 | 0 | 0 | 22 |
| | 1.16 | 1.60 | 2.19 | 0 | 0 | | 1.26 |
| Congenital hip dislocation | 89 | 4 | 12 | 0 | 0 | 2 | 107 |
| | 6.48 | 2.14 | 8.78 | 0 | 0 | | 6.14 |
| Diaphragmatic hernia | 38 | 3 | 4 | 1 | 0 | 0 | 46 |
| | 2.76 | 1.60 | 2.93 | 13.40 | 0 | | 2.64 |
| Down syndrome | 163 | 15 | 8 | 1 | 0 | 3 | 190 |
| | 11.86 | 8.01 | 5.85 | 13.40 | 0 | | 10.91 |
| Ebstein's anomaly | 8 | 1 | 2 | 0 | 0 | 0 | 11 |
| | 0.58 | 0.53 | 1.46 | 0 | 0 | | 0.63 |
| Encephalocele | 9 | 1 | 2 | 0 | 0 | 0 | 12 |
| | 0.65 | 0.53 | 1.46 | 0 | 0 | | 0.69 |
| Endocardial cushion defect | 79 | 8 | 3 | 0 | 0 | 1 | 91 |
| | 5.75 | 4.27 | 2.19 | 0 | 0 | | 5.22 |
| Esophageal atresia/tracheoesophageal fistula | 26 | 2 | 1 | 1 | 0 | 0 | 30 |
| | 1.89 | 1.07 | 0.73 | 13.40 | 0 | | 1.72 |

Note 1—Rates based on fewer than 20 cases are unstable and are not comparable.
Note 2—Race is assigned to the child based on the mother's reporting about herself.
Data compiled on 10/22/2007.

Table 6: Continued. Confirmed and Probable Counts and Rates by Race of the Targeted Conditions for 2003-2004 Births to Indiana Women (Rates per 10,000 live births displayed in shaded area.)

| | Race/Ethnicity | | | | | | |
|---|---|---|---|---|---|---|---|
| Defect | Non-Hispanic White | Non-Hispanic Black | Hispanic | Asian or Pacific Islander | American Indian or Alaskan Native | Other / Unknown | Total |
| Fetus or newborn affected by maternal alcohol use | 31 | 8 | 0 | 0 | 0 | 5 | 44 |
| | 2.26 | 4.27 | 0 | 0 | 0 | | 2.53 |
| Gastroschisis | 35 | 2 | 4 | 0 | 0 | 1 | 42 |
| | 2.55 | 1.07 | 2.93 | 0 | 0 | | 2.41 |
| Hirshsprung's disease (congenital megacolon) | 30 | 4 | 0 | 1 | 0 | 0 | 35 |
| | 2.18 | 2.14 | 0 | 13.40 | 0 | | 2.01 |
| Hydrocephalus without Spina Bifida | 78 | 12 | 6 | 0 | 0 | 2 | 98 |
| | 5.68 | 6.41 | 4.39 | 0 | 0 | | 5.63 |
| Hypoplastic left heart syndrome | 29 | 4 | 0 | 1 | 0 | 0 | 34 |
| | 2.11 | 2.14 | 0 | 13.40 | 0 | | 1.95 |
| Hypospadias and Epispadias | 405 | 48 | 12 | 2 | 0 | 8 | 475 |
| | 29.47 | 25.63 | 8.78 | 26.81 | 0 | | 27.27 |
| Microcephalus | 110 | 20 | 11 | 0 | 0 | 3 | 144 |
| | 8 | 10.68 | 8.04 | 0 | 0 | | 8.27 |
| Obstructive genitourinary defect | 340 | 34 | 19 | 2 | 2 | 7 | 404 |
| | 24.74 | 18.15 | 13.89 | 26.81 | 93.90 | | 23.19 |
| Omphalocele | 6 | 0 | 2 | 0 | 0 | 0 | 8 |
| | 0.44 | 0 | 1.46 | 0 | 0 | | 0.46 |
| Patent ductus arteriosus | 305 | 52 | 23 | 2 | 0 | 3 | 385 |
| | 22.19 | 27.76 | 16.82 | 26.81 | 0 | | 22.10 |
| Pulmonary valve atresia and stenosis | 141 | 18 | 9 | 2 | 0 | 5 | 175 |
| | 10.26 | 9.61 | 6.58 | 26.81 | 0 | | 10.05 |
| Pyloric stenosis | 328 | 19 | 29 | 1 | 0 | 2 | 379 |
| | 23.87 | 10.14 | 21.21 | 13.40 | 0 | | 21.76 |
| Rectal and large intestinal atresia/stenosis | 40 | 4 | 1 | 1 | 0 | 1 | 47 |
| | 2.91 | 2.14 | 0.73 | 13.40 | 0 | | 2.70 |
| Reduction deformity, lower limbs | 17 | 2 | 0 | 0 | 0 | 0 | 19 |
| | 1.24 | 1.07 | 0 | 0 | 0 | | 1.09 |
| Reduction deformity, upper limbs | 39 | 2 | 3 | 0 | 0 | 0 | 44 |
| | 2.84 | 1.07 | 2.19 | 0 | 0 | | 2.53 |
| Renal agenesis/hypoplasia | 28 | 4 | 3 | 1 | 1 | 0 | 37 |
| | 2.04 | 2.14 | 2.19 | 13.40 | 46.95 | | 2.12 |
| Spina bifida without anencephalus | 56 | 4 | 11 | 1 | 0 | 1 | 73 |
| | 4.07 | 2.14 | 8.04 | 13.40 | 0 | | 4.19 |
| Tetralogy of fallot | 42 | 11 | 2 | 0 | 0 | 2 | 57 |
| | 3.06 | 5.87 | 1.46 | 0 | 0 | | 3.27 |
| Transposition of great arteries | 67 | 6 | 5 | 1 | 0 | 1 | 80 |
| | 4.88 | 3.20 | 3.66 | 13.40 | 0 | | 4.59 |
| Tricuspid valve atresia and stenosis | 16 | 0 | 0 | 0 | 0 | 1 | 17 |
| | 1.16 | 0 | 0 | 0 | 0 | | 0.98 |
| Trisomy 13 | 10 | 1 | 5 | 0 | 0 | 1 | 17 |
| | 0.73 | 0.53 | 3.66 | 0 | 0 | | 0.98 |

Note 1—Rates based on fewer than 20 cases are unstable and are not comparable.
Note 2—Race is assigned to the child based on the mother's reporting about herself.
Data compiled on 10/22/2007.

Table 6: Continued. Confirmed and Probable Counts and Rates by Race of the Targeted Conditions for 2003-2004 Births to Indiana Women (Rates per 10,000 live births displayed in shaded area.)

| | Race/Ethnicity | | | | | | |
|---|---|---|---|---|---|---|---|
| **Defect** | Non-Hispanic White | Non-Hispanic Black | Hispanic | Asian or Pacific Islander | American Indian or Alaskan Native | Other / Unknown | Total |
| Trisomy 18 | 10 | 1 | 2 | 1 | 1 | 0 | 15 |
| | 0.73 | 0.53 | 1.46 | 13.40 | 46.95 | | 0.86 |
| Ventricular septal defect | 496 | 44 | 48 | 3 | 3 | 14 | 608 |
| | 36.09 | 23.49 | 35.10 | 40.21 | 140.85 | | 34.90 |
| All Defects | 4111 | 443 | 309 | 25 | 8 | 86 | 4982 |
| | 299.12 | 236.53 | 225.98 | 335.12 | 375.59 | | 285.98 |
| **Total Live Births** | 137435 | 18729 | 13674 | 746 | 213 | | 174206 |

The counts and rates of occurences of defects reflected in this report are based on the Indiana Birth Defects & Problems Registry Data. Only those conditions which have been confirmed or which have been determined to be highly probable by the Chart Audit Process are included in the data. This report is based on real time data and subject to change based on additions and corrections to the data.

Note 1—Rates based on fewer than 20 cases are unstable and are not comparable.
Note 2—Race is assigned to the child based on the mother's reporting about herself.

Data compiled on 10/22/2007.

Table 7: Confirmed and Probable Counts and Rates of Trisomy by Maternal Age for 2003-2004 Births to Indiana Women (Rates per 10,000 live births displayed in the shaded area.)

| | Age | | |
|---|---|---|---|
| **Defect** | **<35** | **35 and >** | **Total(**)** |
| Down syndrome | 114 | 76 | 190 |
| | 7.29 | 42.46 | 10.91 |
| Trisomy 13 | 11 | 6 | 17 |
| | 0.70 | 3.35 | 0.98 |
| Trisomy 18 | 7 | 8 | 15 |
| | 0.45 | 4.47 | 0.86 |
| **Total Live Births** | **156,306** | **17,900** | **174,206** |

The counts and rates of occurences of defects reflected in this report are based on the Indiana Birth Defects & Problems Registry Data. Only those conditions which have been confirmed or which have been determined to be highly probable by the Chart Audit Process are included in the data. This report is based on real time data and subject to change based on additions and corrections to the data.

** Total Includes Unknown Age

Note—Rates based on fewer than 20 cases are unstable and are not comparable.

Data compiled on 10/22/2007.

Table 8: Confirmed and Probable Counts and Rates of Targeted Conditions for 2003-2004 Births to Indiana Women by County (Rates per 1,000 live births.)

| County | Live Births | | |
|---|---|---|---|
| Defect | | Total Number | Rate |
| ADAMS | 1145 | | |
| Ventricular septal defect | | 5 | 4.37 |
| All Defects | | 26 | 22.71 |
| ALLEN | 10097 | | |
| Atrial septal defect | | 91 | 9.01 |
| Cleft lip with and without cleft palate | | 15 | 1.49 |
| Cleft palate without cleft lip | | 10 | 0.99 |
| Coarctation of aorta | | 6 | 0.59 |
| Down syndrome | | 6 | 0.59 |
| Fetus or newborn affected by maternal alcohol use | | 10 | 0.99 |
| Hydrocephalus without Spina Bifida | | 5 | 0.5 |
| Hypospadias and Epispadias | | 26 | 2.58 |
| Microcephalus | | 23 | 2.28 |
| Obstructive genitourinary defect | | 7 | 0.69 |
| Patent ductus arteriosus | | 34 | 3.37 |
| Pulmonary valve atresia and stenosis | | 21 | 2.08 |
| Pyloric stenosis | | 22 | 2.18 |
| Rectal and large intestinal atresia/stenosis | | 6 | 0.59 |
| Tetralogy of fallot | | 5 | 0.5 |
| Ventricular septal defect | | 46 | 4.56 |
| All Defects | | 370 | 36.64 |
| BARTHOLOMEW | 1810 | | |
| Atrial septal defect | | 6 | 3.31 |
| Obstructive genitourinary defect | | 6 | 3.31 |
| Ventricular septal defect | | 5 | 2.76 |
| All Defects | | 44 | 24.31 |
| BENTON | 216 | | |
| All Defects | | * | |
| BLACKFORD | 283 | | |
| All Defects | | 13 | 45.94 |
| BOONE | 1275 | | |
| Atrial septal defect | | 11 | 8.63 |
| Coarctation of aorta | | 6 | 4.71 |
| Obstructive genitourinary defect | | 8 | 6.27 |
| Ventricular septal defect | | 9 | 7.06 |
| All Defects | | 52 | 40.78 |
| BROWN | 287 | | |
| All Defects | | * | |
| CARROLL | 432 | | |
| All Defects | | 9 | 20.83 |
| CASS | 882 | | |
| All Defects | | 18 | 20.41 |
| CLARK | 2012 | | |
| Atrial septal defect | | 6 | 2.98 |
| Hypospadias and Epispadias | | 6 | 2.98 |
| Ventricular septal defect | | 16 | 7.95 |
| All Defects | | 43 | 21.37 |
| CLAY | 567 | | |
| All Defects | | 16 | 28.22 |
| CLINTON | 848 | | |
| All Defects | | 21 | 24.76 |
| CRAWFORD | 208 | | |
| All Defects | | * | |
| DAVIESS | 515 | | |
| All Defects | | 9 | 17.48 |
| DEARBORN | 677 | | |
| All Defects | | 7 | 10.34 |
| DECATUR | 666 | | |
| Pyloric stenosis | | 5 | 7.51 |
| All Defects | | 19 | 28.53 |
| DEKALB | 977 | | |
| Atrial septal defect | | 7 | 7.16 |
| Ventricular septal defect | | 8 | 8.19 |
| All Defects | | 37 | 37.87 |
| DELAWARE | 2489 | | |
| Atrial septal defect | | 28 | 11.25 |
| Hypospadias and Epispadias | | 7 | 2.81 |
| Obstructive genitourinary defect | | 18 | 7.23 |
| Patent ductus arteriosus | | 11 | 4.42 |
| Pyloric stenosis | | 7 | 2.81 |
| Ventricular septal defect | | 16 | 6.43 |
| All Defects | | 117 | 47.01 |
| DUBOIS | 900 | | |
| All Defects | | 16 | 17.78 |

* Indicates <5 in number occurred.
Note—Rates based on fewer than 20 cases are unstable and are not comparable

Data compiled on 10/24/2007.

Table 8: (Continued) Confirmed and Probable Counts and Rates of Targeted Conditions for 2003-2004 Births to Indiana Women by County (Rates per 1,000 live births.)

| | | | |
|---|---|---|---|
| **ELKHART** | **5842** | | |
| Atrial septal defect | | 28 | 4.79 |
| Cleft lip with and without cleft palate | | 5 | 0.86 |
| Coarctation of aorta | | 5 | 0.86 |
| Congenital hip dislocation | | 6 | 1.03 |
| Down syndrome | | 9 | 1.54 |
| Hydrocephalus without Spina Bifida | | 5 | 0.86 |
| Hypospadias and Epispadias | | 6 | 1.03 |
| Microcephalus | | 5 | 0.86 |
| Obstructive genitourinary defect | | 12 | 2.05 |
| Patent ductus arteriosus | | 28 | 4.79 |
| Pulmonary valve atresia and stenosis | | 9 | 1.54 |
| Pyloric stenosis | | 23 | 3.94 |
| Ventricular septal defect | | 27 | 4.62 |
| All Defects | | 206 | 35.26 |
| **FAYETTE** | **502** | | |
| All Defects | | 6 | 11.95 |
| **FLOYD** | **1299** | | |
| Ventricular septal defect | | 5 | 3.85 |
| All Defects | | 18 | 13.86 |
| **FOUNTAIN** | **320** | | |
| All Defects | | 14 | 43.75 |
| **FRANKLIN** | **300** | | |
| All Defects | | 5 | 16.67 |
| **FULTON** | **461** | | |
| All Defects | | 15 | 32.54 |
| **GIBSON** | **483** | | |
| All Defects | | 6 | 12.42 |
| **GRANT** | **341** | | |
| All Defects | | 12 | 35.19 |
| **GREENE** | **354** | | |
| All Defects | | 11 | 31.07 |
| **HAMILTON** | **7124** | | |
| Atrial septal defect | | 18 | 2.53 |
| Cleft lip with and without cleft palate | | 7 | 0.98 |
| Coarctation of aorta | | 7 | 0.98 |
| Congenital hip dislocation | | 8 | 1.12 |
| Down syndrome | | 9 | 1.26 |
| Hypospadias and Epispadias | | 29 | 4.07 |
| Obstructive genitourinary defect | | 39 | 5.47 |
| Patent ductus arteriosus | | 18 | 2.53 |
| Pyloric stenosis | | 13 | 1.82 |
| Ventricular septal defect | | 37 | 5.19 |
| All Defects | | 242 | 33.97 |
| **HANCOCK** | **1507** | | |
| Atrial septal defect | | 9 | 5.97 |
| Hypospadias and Epispadias | | 7 | 4.64 |
| Pyloric stenosis | | 5 | 3.32 |
| Ventricular septal defect | | 6 | 3.98 |
| All Defects | | 52 | 34.51 |
| **HARRISON** | **619** | | |
| All Defects | | * | |
| **HENDRICKS** | **3080** | | |
| Atrial septal defect | | 12 | 3.9 |
| Congenital hip dislocation | | 5 | 1.62 |
| Hypospadias and Epispadias | | 5 | 1.62 |
| Obstructive genitourinary defect | | 10 | 3.25 |
| Patent ductus arteriosus | | 12 | 3.9 |
| Pulmonary valve atresia and stenosis | | 5 | 1.62 |
| Pyloric stenosis | | 5 | 1.62 |
| Ventricular septal defect | | 8 | 2.6 |
| All Defects | | 84 | 27.27 |
| **HENRY** | **907** | | |
| All Defects | | 25 | 27.56 |
| **HOWARD** | **2278** | | |
| Atrial septal defect | | 10 | 4.39 |
| Cleft lip with and without cleft palate | | 6 | 2.63 |
| Hypospadias and Epispadias | | 11 | 4.83 |
| Obstructive genitourinary defect | | 8 | 3.51 |
| Patent ductus arteriosus | | 6 | 2.63 |
| Pyloric stenosis | | 7 | 3.07 |
| Ventricular septal defect | | 7 | 3.07 |
| All Defects | | 83 | 36.44 |
| **HUNTINGTON** | **865** | | |
| Atrial septal defect | | 19 | 21.97 |
| Hypospadias and Epispadias | | 8 | 9.25 |
| Ventricular septal defect | | 5 | 5.78 |
| All Defects | | 58 | 67.05 |
| **JACKSON** | **1048** | | |
| Atrial septal defect | | 8 | 7.63 |
| Pyloric stenosis | | 6 | 5.73 |
| All Defects | | 36 | 34.35 |
| **JASPER** | **710** | | |
| All Defects | | 13 | 18.31 |
| **JAY** | **538** | | |
| Atrial septal defect | | 5 | 9.29 |
| All Defects | | 16 | 29.74 |
| **JEFFERSON** | **625** | | |
| All Defects | | 12 | 19.2 |
| **JENNINGS** | **682** | | |
| Hypospadias and Epispadias | | 8 | 11.73 |
| All Defects | | 22 | 32.26 |
| **JOHNSON** | **3333** | | |
| Atrial septal defect | | 12 | 3.6 |
| Down syndrome | | 5 | 1.5 |
| Hypospadias and Epispadias | | 9 | 2.7 |
| Pyloric stenosis | | 7 | 2.1 |
| Ventricular septal defect | | 6 | 1.8 |
| All Defects | | 80 | 24 |
| **KNOX** | **835** | | |
| All Defects | | 30 | 35.93 |

* Indicates <5 in number occurred.
Note—Rates based on fewer than 20 cases are unstable and are not comparable.
Data compiled on 10/24/2007.

Table 8: (Continued) Confirmed and Probable Counts and Rates of Targeted Conditions for 2003-2004 Births to Indiana Women by County (Rates per 1,000 live births.)

| | | | |
|---|---|---|---|
| **KOSCIUSKO** | **1974** | | |
| Atrial septal defect | | 13 | 6.59 |
| Hypospadias and Epispadias | | 7 | 3.55 |
| Patent ductus arteriosus | | 5 | 2.53 |
| Pyloric stenosis | | 8 | 4.05 |
| All Defects | | 56 | 28.37 |
| **LAGRANGE** | **1148** | | |
| All Defects | | 33 | 28.75 |
| **LAKE** | **12522** | | |
| Atrial septal defect | | 10 | 0.8 |
| Cleft palate without cleft lip | | 6 | 0.48 |
| Congenital hip dislocation | | 7 | 0.56 |
| Down syndrome | | 13 | 1.04 |
| Hydrocephalus without Spina Bifida | | 7 | 0.56 |
| Hypospadias and Epispadias | | 20 | 1.6 |
| Microcephalus | | 5 | 0.4 |
| Obstructive genitourinary defect | | 15 | 1.2 |
| Patent ductus arteriosus | | 7 | 0.56 |
| Pyloric stenosis | | 22 | 1.76 |
| Ventricular septal defect | | 32 | 2.56 |
| All Defects | | 196 | 15.65 |
| **LAPORTE** | **2363** | | |
| Atrial septal defect | | 11 | 4.66 |
| Hypospadias and Epispadias | | 7 | 2.96 |
| Obstructive genitourinary defect | | 6 | 2.54 |
| Patent ductus arteriosus | | 14 | 5.92 |
| Pyloric stenosis | | 8 | 3.39 |
| Ventricular septal defect | | 12 | 5.08 |
| All Defects | | 85 | 35.97 |
| **LAWRENCE** | **995** | | |
| Obstructive genitourinary defect | | 8 | 8.04 |
| All Defects | | 25 | 25.13 |
| **MADISON** | **3040** | | |
| Atrial septal defect | | 7 | 2.3 |
| Hypospadias and Epispadias | | 9 | 2.96 |
| Microcephalus | | 5 | 1.64 |
| Obstructive genitourinary defect | | 11 | 3.62 |
| Pyloric stenosis | | 7 | 2.3 |
| Ventricular septal defect | | 9 | 2.96 |
| All Defects | | 93 | 30.59 |
| **MARION** | **27982** | | |
| Aortic valve stenosis | | 5 | 0.18 |
| Atrial septal defect | | 108 | 3.86 |
| Autism | | 5 | 0.18 |
| Choanal atresia | | 7 | 0.25 |
| Cleft lip with and without cleft palate | | 21 | 0.75 |
| Cleft palate without cleft lip | | 25 | 0.89 |
| Coarctation of aorta | | 15 | 0.54 |
| Congenital cataract | | 5 | 0.18 |
| Congenital hip dislocation | | 15 | 0.54 |
| Diaphragmatic hernia | | 10 | 0.36 |
| Down syndrome | | 28 | 1 |
| Endocardial cushion defect | | 9 | 0.32 |
| Esophageal atresia/tracheoesophageal fistula | | 5 | 0.18 |
| Fetus or newborn affected by maternal alcohol use | | 5 | 0.18 |
| Gastroschisis | | 10 | 0.36 |
| Hirshsprung's disease (congenital megacolon) | | 6 | 0.21 |
| Hydrocephalus without Spina Bifida | | 25 | 0.89 |
| Hypoplastic left heart syndrome | | 5 | 0.18 |
| Hypospadias and Epispadias | | 97 | 3.47 |
| Microcephalus | | 26 | 0.93 |
| Obstructive genitourinary defect | | 83 | 2.97 |
| Patent ductus arteriosus | | 69 | 2.47 |
| Pulmonary valve atresia and stenosis | | 27 | 0.96 |
| Pyloric stenosis | | 61 | 2.18 |
| Rectal and large intestinal atresia/stenosis | | 8 | 0.29 |
| Reduction deformity, upper limbs | | 5 | 0.18 |
| Renal agenesis/hypoplasia | | 8 | 0.29 |
| Spina bifida without anencephalus | | 8 | 0.29 |
| Tetralogy of fallot | | 10 | 0.36 |
| Transposition of great arteries | | 16 | 0.57 |
| Trisomy 13 | | 5 | 0.18 |
| Ventricular septal defect | | 87 | 3.11 |
| All Defects | | 836 | 29.88 |
| **MARSHALL** | **1190** | | |
| All Defects | | 19 | 15.97 |
| **MARTIN** | **123** | | |
| All Defects | | 5 | 40.65 |
| **MIAMI** | **758** | | |
| All Defects | | 18 | 23.75 |
| **MONROE** | **2396** | | |
| Atrial septal defect | | 8 | 3.34 |
| Hypospadias and Epispadias | | 7 | 2.92 |
| Obstructive genitourinary defect | | 5 | 2.09 |
| Patent ductus arteriosus | | 8 | 3.34 |
| Ventricular septal defect | | 8 | 3.34 |
| All Defects | | 62 | 25.88 |
| **MONTGOMERY** | **821** | | |
| All Defects | | 15 | 18.27 |

* Indicates <5 in number occurred.
Note—Rates based on fewer than 20 cases are unstable and are not comparable.

Data compiled on 10/24/2007.

Table 8: (Continued) Confirmed and Probable Counts and Rates of Targeted Conditions for 2003-2004 Births to Indiana Women by County (Rates per 1,000 live births.)

| | | | |
|---|---|---|---|
| **MORGAN** | **1664** | | |
| Hypospadias and Epispadias | | 13 | 7.81 |
| Ventricular septal defect | | 5 | 3 |
| All Defects | | 55 | 33.05 |
| **NEWTON** | **240** | | |
| All Defects | | 5 | 20.83 |
| **NOBLE** | **1226** | | |
| Ventricular septal defect | | 8 | 6.53 |
| All Defects | | 46 | 37.52 |
| **OHIO** | **95** | | |
| All Defects | | * | |
| **ORANGE** | **389** | | |
| All Defects | | 14 | 35.99 |
| **OWEN** | **422** | | |
| All Defects | | 16 | 37.91 |
| **PARKE** | **264** | | |
| All Defects | | 6 | 22.73 |
| **PERRY** | **362** | | |
| All Defects | | 9 | 24.86 |
| **PIKE** | **252** | | |
| All Defects | | 12 | 47.62 |
| **PORTER** | **3463** | | |
| Atrial septal defect | | 5 | 1.44 |
| Down syndrome | | 7 | 2.02 |
| Hypospadias and Epispadias | | 7 | 2.02 |
| Obstructive genitourinary defect | | 6 | 1.73 |
| Pyloric stenosis | | 10 | 2.89 |
| Ventricular septal defect | | 17 | 4.91 |
| All Defects | | 90 | 25.99 |
| **POSEY** | **537** | | |
| All Defects | | 10 | 18.62 |
| **PULASKI** | **283** | | |
| All Defects | | 5 | 17.67 |
| **PUTNAM** | **713** | | |
| Atrial septal defect | | 5 | 7.01 |
| All Defects | | 27 | 37.87 |
| **RANDOLPH** | **486** | | |
| All Defects | | 10 | 20.58 |
| **RIPLEY** | **591** | | |
| All Defects | | 10 | 16.92 |
| **RUSH** | **326** | | |
| All Defects | | 18 | 55.21 |
| **SCOTT** | **485** | | |
| Atrial septal defect | | 6 | 12.37 |
| All Defects | | 19 | 39.18 |
| **SHELBY** | **996** | | |
| Atrial septal defect | | 6 | 6.02 |
| Ventricular septal defect | | 8 | 8.03 |
| All Defects | | 43 | 43.17 |
| **SPENCER** | **324** | | |
| All Defects | | 8 | 24.69 |
| **STARKE** | **513** | | |
| All Defects | | 7 | 13.65 |
| **STEUBEN** | **658** | | |
| Pyloric stenosis | | 5 | 7.6 |
| All Defects | | 21 | 31.91 |
| **STJOSEPH** | **6969** | | |
| Atrial septal defect | | 27 | 3.87 |
| Cleft lip with and without cleft palate | | 5 | 0.72 |
| Congenital hip dislocation | | 5 | 0.72 |
| Down syndrome | | 11 | 1.58 |
| Endocardial cushion defect | | 6 | 0.86 |
| Hydrocephalus without Spina Bifida | | 11 | 1.58 |
| Hypospadias and Epispadias | | 10 | 1.43 |
| Microcephalus | | 5 | 0.72 |
| Obstructive genitourinary defect | | 7 | 1 |
| Patent ductus arteriosus | | 46 | 6.6 |
| Pyloric stenosis | | 9 | 1.29 |
| Ventricular septal defect | | 21 | 3.01 |
| All Defects | | 217 | 31.14 |
| **SULLIVAN** | **368** | | |
| All Defects | | 8 | 21.74 |
| **SWITZERLAND** | **185** | | |
| All Defects | | * | |
| **TIPPECANOE** | **3887** | | |
| Atrial septal defect | | 14 | 3.6 |
| Cleft lip with and without cleft palate | | 6 | 1.54 |
| Down syndrome | | 8 | 2.06 |
| Hypospadias and Epispadias | | 8 | 2.06 |
| Patent ductus arteriosus | | 7 | 1.8 |
| Pulmonary valve atresia and stenosis | | 7 | 1.8 |
| Pyloric stenosis | | 5 | 1.29 |
| Ventricular septal defect | | 15 | 3.86 |
| All Defects | | 100 | 25.73 |
| **TIPTON** | **366** | | |
| All Defects | | 10 | 27.32 |
| **UNION** | **40** | | |
| All Defects | | * | |

* Indicates <5 in number occurred.

Note—Rates based on fewer than 20 cases are unstable and are not comparable.

Data compiled on 10/24/2007.

Table 8: (Continued) Confirmed and Probable Counts and Rates of Targeted Conditions for 2003-2004 Births to Indiana Women by County (Rates per 1,000 live births.)

| | | | |
|---|---|---|---|
| **VANDERBURGH** | **4479** | | |
| Atrial septal defect | | 5 | 1.12 |
| Coarctation of aorta | | 5 | 1.12 |
| Hypospadias and Epispadias | | 13 | 2.9 |
| Obstructive genitourinary defect | | 7 | 1.56 |
| Patent ductus arteriosus | | 8 | 1.79 |
| Pyloric stenosis | | 20 | 4.47 |
| Ventricular septal defect | | 15 | 3.35 |
| All Defects | | 111 | 24.78 |
| **VERMILLION** | **313** | | |
| All Defects | | 12 | 38.34 |
| **VIGO** | **2442** | | |
| Atrial septal defect | | 7 | 2.87 |
| Hypospadias and Epispadias | | 6 | 2.46 |
| Microcephalus | | 5 | 2.05 |
| Obstructive genitourinary defect | | 9 | 3.69 |
| Patent ductus arteriosus | | 7 | 2.87 |
| Pyloric stenosis | | 9 | 3.69 |
| Ventricular septal defect | | 6 | 2.46 |
| All Defects | | 74 | 30.3 |
| **WABASH** | **669** | | |
| Atrial septal defect | | 6 | 8.97 |
| Ventricular septal defect | | 6 | 8.97 |
| All Defects | | 32 | 47.83 |
| **WARREN** | **151** | | |
| All Defects | | 5 | 33.11 |
| **WARRICK** | **1253** | | |
| Hypospadias and Epispadias | | 5 | 3.99 |
| Obstructive genitourinary defect | | 5 | 3.99 |
| All Defects | | 29 | 23.14 |
| **Total Live Births** | **174206** | | |

| | | | |
|---|---|---|---|
| **WASHINGTON** | **584** | | |
| All Defects | | 7 | 11.99 |
| **WAYNE** | **1464** | | |
| Obstructive genitourinary defect | | 5 | 3.42 |
| Ventricular septal defect | | 5 | 3.42 |
| All Defects | | 38 | 25.96 |
| **WELLS** | **664** | | |
| Atrial septal defect | | 7 | 10.54 |
| Ventricular septal defect | | 6 | 9.04 |
| All Defects | | 31 | 46.69 |
| **WHITE** | **562** | | |
| All Defects | | 13 | 23.13 |
| **WHITLEY** | **738** | | |
| Hypospadias and Epispadias | | 5 | 6.78 |
| All Defects | | 29 | 39.3 |
| **UNKNOWN** | **19132** | | |
| Aortic valve stenosis | | 5 | 0.26 |
| Atrial septal defect | | 59 | 3.08 |
| Autism | | 5 | 0.26 |
| Cleft lip with and without cleft palate | | 13 | 0.68 |
| Coarctation of aorta | | 5 | 0.26 |
| Congenital hip dislocation | | 14 | 0.73 |
| Down syndrome | | 18 | 0.94 |
| Endocardial cushion defect | | 10 | 0.52 |
| Hydrocephalus without Spina Bifida | | 5 | 0.26 |
| Hypospadias and Epispadias | | 40 | 2.09 |
| Microcephalus | | 11 | 0.57 |
| Obstructive genitourinary defect | | 28 | 1.46 |
| Patent ductus arteriosus | | 20 | 1.05 |
| Pulmonary valve atresia and stenosis | | 16 | 0.84 |
| Pyloric stenosis | | 31 | 1.62 |
| Spina bifida without anencephalus | | 7 | 0.37 |
| Tetralogy of fallot | | 5 | 0.26 |
| Transposition of great arteries | | 6 | 0.31 |
| Ventricular septal defect | | 51 | 2.67 |
| All Defects | | 394 | 20.59 |

* Indicates <5 in number occurred.
Note—Rates based on fewer than 20 cases are unstable and are not comparable.

Data compiled on 10/24/2007.